Australian Bureau of Statistics

6105.0 - Australian Labour Market Statistics, Apr 2003

Summary

About this Release

ABOUT THIS RELEASE

Replaces: Labour Force, Australia 6203.0

This publication is the flagship release for all ABS labour statistics. It draws together data from a range of sources, mostly ABS household and business surveys, to provide an overall picture of the labour market. The key purpose of this publication is to raise awareness of the data available, so that users will be able to use it more effectively.

It contains tables for core data items, presenting the most recent data available at a particular date (rather than relating to a particular reference period). It is also able to be used to announce the release of supplementary surveys and infrequent surveys. Note that, in addition to a brief article in this publication, these would also have separate releases, which would not be delayed by the release in this publication.

The publication is also used to release annual data on Indigenous labour force status, and annual supplementary measures of labour underutilisation. It includes a range of feature articles, both analytical and technical, which will assist users in understanding and interpreting the data and will also promote the range of data available from the ABS labour statistics program. It will be used to announce any changes to labour series or releases.

The publication contains brief explanatory notes, outlining each data source, but referring to the relevant releases, and to Labour Statistics: Concepts, Sources and Methods 6102.0, for more detail.

Technical report: Labour Force Survey sample redesign (Feature Article)

Feature Article - Technical report: Labour Force Survey sample redesign

OVERVIEW

Every five years, following the availability of data from the Census of Population and Housing, the ABS reviews the LFS sample design. While the design has remained broadly the same since the introduction of the LFS, the review ensures that the survey continues to accurately reflect the geographic distribution of the Australian population, and remains efficient and cost-effective.

The review based on 2001 Census data has been completed, and the new sample design is being gradually implemented in the LFS over the period November 2002 to June 2003. This article briefly describes the multi-stage sampling method used in the LFS, and then outlines the key features of the 2001 sample redesign. For more details, see **Information Paper: Labour Force Survey Sample Design** (cat. no. 6269.0) published in December 2002.

SAMPLE DESIGN

Sample selection

In the LFS, private dwellings (houses, flats, etc.) and non-private dwellings (hotels, motels, caravan parks, hospitals, homes for the aged, university colleges, boarding houses, etc.) are sampled separately.

For private dwellings, multi-stage area sampling is used. Using the Statistical Division and Subdivision structure of the Australian Standard Geographical Classification (ASGC), Australia is first divided into 100 geographical areas. These areas are then grouped (stratified) according to population density, remoteness and growth, then:

- in the first stage of selection, a systematic random sample of census collection districts is selected in each stratum (with probability proportional to size) from a geographically ordered list of collection districts

- in the second stage of selection, each selected collection district is divided into smaller areas called blocks, of which one block is selected randomly (with probability proportional to size) from a geographically ordered list of blocks

- in the third stage, a sample of dwellings in the selected block is taken using systematic equal probability sampling.

In less populated areas, an additional stage precedes the selection of collection districts to ensure that the sample is not too geographically spread (as that would lead to unacceptable enumeration costs).

The sample of non-private dwellings is obtained by compiling a list of non-private dwellings in Australia. A systematic random sample is taken from this list (with probability proportional to size) in such a way that each region across Australia and each different type of non-private dwelling is represented. For smaller non-private dwellings, each occupant is included in the survey; for larger dwellings, a sub-sample of occupants is taken.

Allocation of sample

The LFS is designed primarily to provide reliable estimates of key labour force aggregates for the whole of Australia and, secondarily, for each state and territory.

The most accurate national estimates would be obtained if the total sample for Australia were allocated in proportion to the population of each state or territory. However, for each state or territory to have estimates as accurate as one another, equal size samples would be needed

for each.

The allocation of the sample across the states and territories is a compromise between one that would be optimum for national purposes (i.e. the same sampling rate in each state and territory) and one that would give each state and territory the same accuracy (i.e. the same sample size in each). That is, the proportion of the population in the sample (known as the sampling fraction) differs across states and territories, but not to the extent that would realise identical sample sizes for each state and territory. Within each state and territory, each dwelling has the same probability of selection.

Sample rotation

One of the primary requirements of the survey is to provide a measure of change in the characteristics of the labour force over time, especially month-to-month variations.

The best estimate of month-to-month change would require data to be collected from essentially the same sample of dwellings each month (while providing for population growth). However, it is not reasonable to retain respondents in the survey indefinitely. A proportion of the sample is therefore deliberately replaced each month. This procedure is known as **sample rotation**.

Since the monthly LFS began in 1978, one-eighth of the sample has generally been replaced each month. The sample can be thought of as consisting of eight sub-samples (or rotation groups), with a new rotation group being introduced into the sample each month to replace an outgoing rotation group. This replacement sample usually comes from the same area as the outgoing one.

Sample rotation enables reliable measures of monthly change in labour force statistics to be compiled, as seven-eighths of the sample from one month is retained for the next month's survey. At the same time, the sample rotation procedure ensures that no dwelling is retained in the sample for more than eight months.

The component of the sample that is common from one month to the next makes it possible to match the characteristics of most of the people in those dwellings: this group is referred to as the 'matched sample'. The availability of this matched sample permits the production of estimates of 'gross flows' - the number of people who change labour force status between successive months.

2001 SAMPLE REDESIGN

Redesign aims

Reflecting its importance in maintaining the efficiency and effectiveness of the LFS, development of the 2001 redesign included the following key aims:

- to achieve a level of accuracy for national employment and unemployment estimates comparable with the previous sample design

- to maintain the same relative level of accuracy among the states and territories as the previous sample design

- to contain the costs of collection for the LFS sample

- to provide sufficient sample for the LFS over the five-year period 2003-2007.

Design changes

A number of improvements were considered in developing the new design. The more significant changes being implemented are:

- the sample selection stage in less populated areas now relies upon the ASGC remoteness structure, in place of the previous reliance on population density

- in hotels and motels, only those units occupied by usual residents are to be enumerated, while the survey estimation procedures provide for guests to be associated with their own usual residence where possible

- the introduction of a sample frame for Indigenous communities as an aid to enumeration in the LFS and household surveys generally

- the use of more robust and more current information in the technical stages of sample design (for cost and sampling error) and of sample selection (for selecting collections districts by size), realising a small gain in sample efficiency.

Sample size

Use of a constant sampling fraction between sample redesigns has the effect that the number of dwellings in the sample increases as the population grows.

The graph below shows the number of persons enumerated in the LFS sample each month from 1992 to 2002, illustrating the gradual increase in the number of people enumerated between each redesign. While this results in some improvement in the accuracy of the survey results, the improvement is partially offset by a deterioration in the efficiency of the sample in the period since the previous redesign.

Further, as more dwellings are added to the survey over time, the operational costs of collecting the data increase. To offset these increases in cost, the sample size is reduced at each redesign. The decrease in sample size following the 1991 and 1996 Census redesigns can be seen on the graph below. The grey line at the right shows the expected decrease in sample size during the period November 2002 to June 2003, as the sample from the 2001 Census redesign is implemented.

LABOUR FORCE SURVEY MONTHLY SAMPLE: Persons
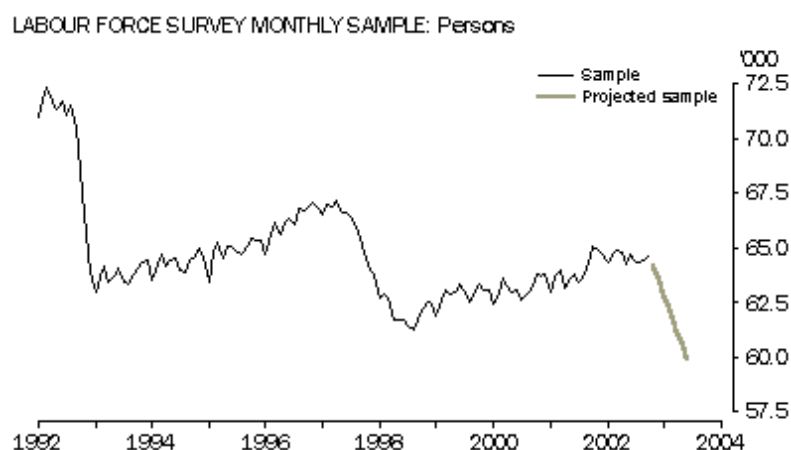
Following implementation of the 2001 design, the initial sample size is expected to be about 3% smaller than at the start of the 1996 design. Despite this reduction in sample size, the

levels of sampling variability (averaged over the life of the new sample) associated with estimates of both level and month-to-month movement are expected to be little different from those realised over the life of the previous design. This is the result of a small gain in efficiency in the 2001 design compared with the previous design.

When fully implemented in June 2003, it is expected that there will be about 28,600 private dwellings and 1,900 non-private dwellings in the sample each month, representing about 1 in 224 (0.45%) of dwellings across Australia. This is expected to result in about 60,000 people responding to the survey each month.

Sampling fractions

Unlike previous designs, the state and territory sampling fractions were an output from the design process, rather than an input.

Sampling fractions have changed little beyond that which would be expected from adjusting the 1996 design for population changes, except for the Northern Territory. Greater efficiency gains were found in the Northern Territory sample under this redesign, enabling a smaller sample to be allocated. As a result, a substantial improvement in accuracy of unemployment estimates has been realised for the Northern Territory, partially offset by slight reduction in accuracy of employment estimates.

The following table gives the sampling fractions used for each state and territory, from the 1976 Census redesign to the new, 2001 Census redesign.

REDESIGN SAMPLING FRACTIONS

State or territory	1976	1981	1986	1991	1996	2001(a)
New South Wales	1 in 200	1 in 200	1 in 230	1 in 277	1 in 300	1 in 321
Victoria	1 in 200	1 in 200	1 in 230	1 in 242	1 in 257	1 in 270
Queensland	1 in 140	1 in 140	1 in 160	1 in 195	1 in 222	1 in 239
South Australia	1 in 100	1 in 100	1 in 115	1 in 139	1 in 147	1 in 149
Western Australia	1 in 90	1 in 100	1 in 115	1 in 146	1 in 160	1 in 165
Tasmania	1 in 60	1 in 60	1 in 70	1 in 75	1 in 83	1 in 90
Northern Territory	1 in 100	1 in 100	1 in 115	1 in 75	1 in 85	1 in 98
Australian Capital Territory	1 in 100	1 in 100	1 in 115	1 in 75	1 in 85	1 in 86

Footnote
(a) Final fractions. Note, preliminary fractions were included in **Information Paper: Labour Force Survey Sample Design** (cat. no. 6269.0).

Relative standard errors

Averaged over the life of the new sample design, relative standard errors (RSEs) for employment and unemployment at the national level are expected to be the same as those achieved under the previous sample design, as the table below shows.

RSEs for employment and unemployment at the state or territory level are expected to be practically the same as those achieved under the previous sample design. In the case of the Northern Territory, a slight increase is expected for the RSE of employment, more than offset by an improvement in the RSE for unemployment.

While the redesign results in a smaller sample, the improved design more than offsets the increase in variance that would result from a sample size decrease taken in isolation from the redesign.

LFS RELATIVE STANDARD ERRORS

State or territory	Employment		Unemployment	
	1996 design %	2001 design %	1996 design %	2001 design %
New South Wales	0.8	0.8	4.7	4.7
Victoria	0.8	0.8	4.7	4.7
Queensland	1.0	1.0	4.6	4.6
South Australia	1.2	1.2	5.6	5.6
Western Australia	1.0	1.0	5.7	5.7
Tasmania	1.7	1.7	7.4	7.4
Northern Territory	4.0	4.2	18.1	16.3
Australian Capital Territory	1.3	1.3	10.7	10.6
Australia	**0.4**	**0.4**	**2.2**	**2.2**

Further information about sampling variability and standard errors for LFS data will be published later in 2003 in **Information Paper: Labour Force Survey Standard Errors** (cat. no. 6298.0).

IMPLEMENTATION EFFECTS

Phase-in period

In order to reduce the potential impact of the change in sample on labour force statistics, the new sample is being introduced progressively, taking advantage of the existing sample rotation scheme.

The private dwelling sample in larger urban centres and less remote areas, representing just over four-fifths (82.1%) of the total sample, is being phased-in over the period November 2002 to June 2003. Within these areas, one-eighth of the new sample will be introduced each month under existing sample rotation arrangements.

The rest of the sample (in the more remote, less populated areas and for non-private dwellings) was introduced in two stages: in November 2002 for New South Wales, Victoria, Tasmania, the Northern Territory and the Australian Capital Territory; and in December 2002 for Queensland, South Australia and Western Australia.

This method of implementation means that most of the changes to labour force statistics due to differences between the two samples, or any other influences, will be spread over the eight months. This approach is broadly comparable with that adopted for the 1996 redesign. In contrast, the approach adopted for the 1981 redesign saw the new sample introduced in one month, while in the 1986 and 1991 redesigns, the new sample was introduced over four months.

To assist in the interpretation of published estimates during the phase-in period, the ABS has been investigating the labour force characteristics of the new sample in comparison with the

sample that it is replacing. Analyses have included using alternative estimation methods that place greater emphasis on the sample that is common between consecutive months of the survey. These methods have produced estimates of employment growth for the five-month period November 2002 to March 2003 that are very similar to the published increase, although with a less volatile monthly pattern. For more detail, see Notes on Estimates published in recent issues of **Labour Force, Australia, Preliminary** (cat. no. 6202.0).

Standard errors

Standard errors associated with the redesigned sample (when fully implemented) will be similar to those of the previous sample, as discussed above. However, standard errors of monthly movement during implementation of the new sample will be higher than for other periods, because month-to-month correlations of survey estimates are reduced. This arises because new-sample dwellings rotated into the sample each month tend to come from different areas to the old-sample dwellings rotated out (by contrast, in periods other than when a new sample is being implemented, dwellings rotating into the sample each month tend to be next door to those rotating out).

During the implementation period, movement standard errors will be highest for October-November 2002 and November-December 2002, because of the higher sample rotation rates in these two periods for the more remote areas and non-private dwellings.

While additional sampling error is expected during implementation of the new sample, there is no evidence from analyses undertaken so far that the change of sample has otherwise affected estimates of employment growth. Analysis is continuing, and the ABS will publish results when they are completed.

FURTHER INFORMATION

For further information about the Labour Force Survey sample design, or about the statistical regions defined from November 2002, see **Information Paper: Labour Force Survey Sample Design** (cat. no. 6269.0). Descriptions of the underlying concepts and structure of Australia's labour force statistics, and of the sources and methods used in compiling the estimates are presented in **Labour Statistics: Concepts, Sources and Methods** (cat. no. 6102.0), which is also available on the ABS web site (About Statistics - Concepts and Classifications).

Characteristics of underemployed workers (Feature Article)

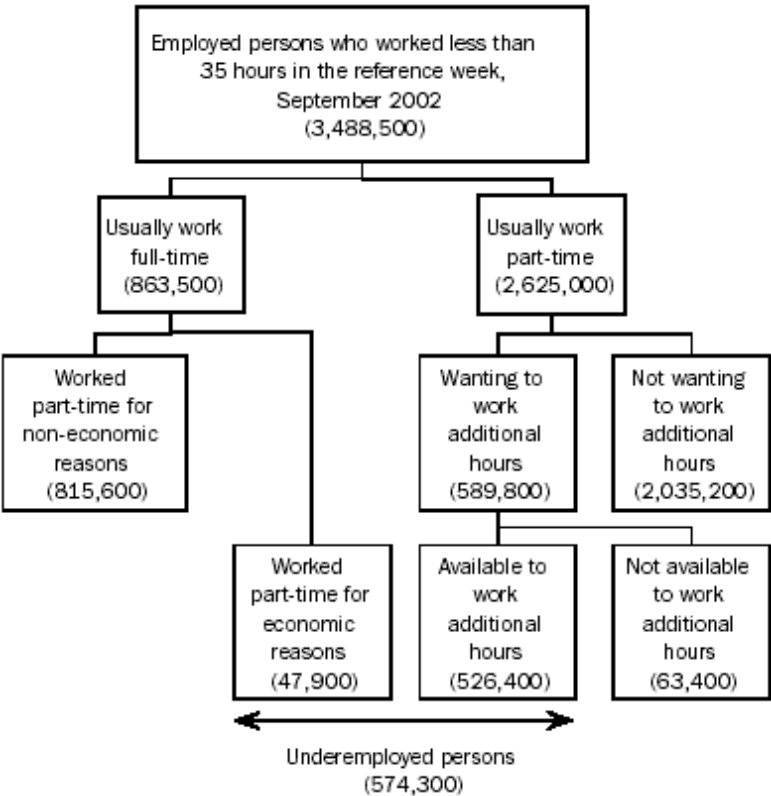## Feature Article - Characteristics of underemployed workers

INTRODUCTION

The number of persons employed part-time has increased considerably over recent decades, and in September 2002 accounted for 28% of total employment. The majority of part-time workers (78% in September 2002) do not want to work additional hours. The 22% of part-time workers who would prefer to work more hours can be considered as persons whose labour is not fully utilised. The rate of growth in the labour force is likely to slow as Australia's population continues to age. As a result, minimising the amount of underutilised labour

resources will become increasingly important in maintaining economic growth.

The ABS provides a wide range of information on available labour resources and the extent of their utilisation. Underemployment, like unemployment, reflects labour resources which have been offered but which are underutilised. Together, they represent the underutilised labour within the labour force.

The ABS includes, in its definition of underemployed, people who work part-time (i.e. less than 35 hours a week), want to work additional hours, and are available to do so. These people may want a different job with more hours, or an additional job, or longer hours in their current job. The underemployed also include a relatively small group of workers who usually work full-time but worked part-time in the reference week due to economic reasons (e.g. they had been stood down, put on short time or there was insufficient work available for them). It is assumed that these workers wanted to work full-time and would have been available to do so. These two groups of underemployed people meet the definition of 'time-related underemployment' set down by the International Labour Organisation.

Underemployment

```
                    Employed persons who worked less than
                       35 hours in the reference week,
                             September 2002
                               (3,488,500)
                    ┌─────────────────┴─────────────────┐
            Usually work                          Usually work
             full-time                             part-time
            (863,500)                             (2,625,000)
                 │                        ┌────────────┴────────────┐
                 │                   Wanting to              Not wanting
                 │                     work                  to work
          ┌──────┴─────┐             additional              additional
      Worked                           hours                   hours
      part-time for                   (589,800)              (2,035,200)
      non-economic                        │
      reasons                             │
      (815,600)                           │
                 │                         
          ┌──────┴───────┬────────────────┬──────────────┐
       Worked        Available to      Not available
       part-time for    work           to work
       economic       additional       additional
       reasons         hours            hours
       (47,900)       (526,400)         (63,400)

                 ◄───────────────────────►
                    Underemployed persons
                         (574,300)
```

This article describes some of the characteristics of underemployed people, particularly underemployed part-time workers, using results from the ABS Survey of Underemployed Workers. This annual survey focuses on people who worked less than 35 hours in the week prior to the survey and who preferred to work more hours, providing detailed information about their availability to start work with more hours, their preferred number of additional hours, their job search activities, and their experience in looking for work with more hours. Results from the September 2002 survey were released in April 2003 in **Underemployed Workers, Australia** (cat. no. 6265.0).

UNDEREMPLOYED WORKERS - September 2002

	Males	Females	Persons

Part-time workers wanting more hours who were available to start work with more hours				
Looking and available to start	'000	124.9	168.5	293.4
Not looking but available to start	'000	79.2	153.9	233.0
Full-time workers who worked less than 35 hours in the reference week for economic reasons	'000	36.3	11.6	47.9
Total underemployed workers	'000	**240.3**	**334.0**	**574.3**
Underemployment rate(a)	%	4.3	7.5	5.7

Footnote
(a) Underemployed workers as a percentage of the labour force

Between September 1994 and September 2002, the number of underemployed people increased by 25%, from 459,000 to 574,000 and the underemployment rate (i.e. underemployed workers as a percentage of the labour force) increased from 5.1% to 5.7%. The underemployed now comprise almost half (48%) of all people with underutilised labour in the labour force, compared with 36% in 1994.

FULL-TIME WORKERS WORKING PART-TIME FOR ECONOMIC REASONS

In September 2002, 8% of underemployed people (48,000 persons) worked part-time for economic reasons, e.g. stood down. Men were more likely than women to be underemployed for these reasons (15% of underemployed men in September 2002, compared with 3% of underemployed women).

UNDEREMPLOYED PART-TIME WORKERS

Demographic characteristics

Most underemployed people (92% in September 2002) are part-time workers wanting more work. The majority of underemployed people are also women, reflecting the fact that women are far more likely to be working part-time than men. In September 2002 there were 1.9 million women working part-time, compared with 749,000 men. However, men working part-time are more likely to be underemployed than women working part-time, although this difference has decreased slightly in recent years. In 1994, 33% of all male part-time workers were underemployed, compared with 17% of female part-time workers. In 2002, these proportions were 27% and 17% respectively.

PART-TIME WORKERS, Proportion who were underemployed—1994–2002

Underemployed part-time workers tend to be younger than other part-time workers. They are more likely to be aged under 25 years (37% of underemployed part-time workers in September 2002 compared with 30% of all part-time workers) and less likely to be aged 45 years or over (22% compared with 32%).

ALL PART-TIME WORKERS, Age group and sex - September 2002

Age group (years)		Underemployed part-time workers			All part-time workers		
		Males	**Females**	**Persons**	**Males**	**Females**	**Persons**
15-19	%	22.2	18.0	19.6	26.7	13.9	17.5
20-24	%	21.4	15.1	17.5	17.9	10.0	12.2
25-34	%	17.9	18.8	18.4	12.9	18.2	16.7
35-44	%	17.4	25.4	22.3	11.9	25.6	21.7
45-54	%	12.4	18.4	16.1	12.2	21.2	18.7
55 and over	%	8.7	4.4	6.1	18.5	11.1	13.2
Total	**%**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Total	**'000**	**204.0**	**322.4**	**526.4**	**748.6**	**1,876.4**	**2,625.0**

Geographic distribution and willingness to move

The geographic distribution of underemployed part-time workers, and of underemployed workers as a whole, generally follows that of all part-time workers. In September 2002, part-time workers usually resident in Tasmania, Queensland and New South Wales were the most likely to be underemployed, while those with usual residences in the Australian Capital Territory, Victoria and the Northern Territory were least likely to be underemployed. Other than in the Northern Territory, underemployed part-time workers were more likely to state that they would be willing to move intrastate than interstate if offered a suitable job.

UNDEREMPLOYED PART-TIME WORKERS, Whether would move if offered a job - September 2002

State or territory of usual residence	Underemployed part-time workers			Proportion of all part-time workers who were underemployed
	Would move interstate if offered a suitable job	**Would move intrastate if offered a suitable job**	**Total**	
	%	%	'000	%
New South Wales	16.8	22.8	174.9	21.1
Victoria	16.3	21.1	119.3	17.7
Queensland	22.0	31.9	110.2	21.6
South Australia	22.7	26.6	42.0	19.6
Western Australia	20.7	26.3	56.6	20.1
Tasmania	23.5	29.3	14.1	24.0
Northern Territory	30.4	28.8	2.6	18.2
Australian Capital Territory	32.6	33.6	6.6	15.1
Australia	**19.1**	**25.3**	**526.4**	**20.1**

Willingness to change occupation or employer

In general, underemployed part-time workers were more prepared to change their occupations to get additional work than change their employers or businesses. Of those who stated a preference, 61% wanted to stay with their current employer, while 50% wanted to change occupations.

UNDEREMPLOYED PART-TIME WORKERS, Whether would change employer or occupation - September 2002

Whether would change employer or occupation	Males %	Females %	Persons %
Whether would prefer to change employer/business			
Would prefer to change employer/business	33.1	30.9	31.8
Would prefer not to change employer/business	48.0	51.7	50.3
No preference	18.9	17.4	17.9
Whether would prefer to change occupation			
Would prefer to change occupation	41.7	41.3	41.5
Would prefer not to change occupation	39.6	43.0	41.6
No preference	18.7	15.7	16.9
Total	**100.0**	**100.0**	**100.0**

Preferred extra hours

In September 2002, part-time workers who were underemployed preferred to work an average extra 15 hours. Underemployed men wanted more additional hours than underemployed women (17 hours compared with 14 hours). In general, underemployed persons working shorter hours wanted to increase their hours of work by more than those working longer hours.

UNDEREMPLOYED PART-TIME WORKERS - September 2002

Usual number of hours worked	Distribution of usual hours worked			Mean preferred number of extra hours		
	Males %	Females %	Persons %	Males hours	Females hours	Persons hours
1-5	12.1	13.2	12.8	20.9	17.7	18.9
6-10	15.4	19.6	17.9	20.4	17.5	18.5
11-15	14.4	16.4	15.6	19.9	15.3	16.9
16-20	24.0	20.3	21.7	18.1	14.4	16.0
21-29	19.4	20.7	20.2	13.0	10.9	11.7
30-34	14.8	9.8	11.7	9.0	7.9	8.4
Total	**100.0**	**100.0**	**100.0**	**16.7**	**14.2**	**15.2**

Preference for full-time work

While all underemployed workers want to work more hours, not all want to work full-time. Underemployed men are more likely to want full-time work than underemployed women. In

September 2002, almost three-quarters (73%) of all underemployed male part-time workers wanted full-time work, compared with nearly half (49%) of underemployed female part-time workers.

Volume of underemployment

Underemployment is usually measured and analysed in terms of 'headcounts', such as the number of people who are underemployed, or the number of underemployed expressed as a proportion of employed people or of the total labour force. However, it can also be analysed in 'volume' measures, i.e. in terms of the number of extra hours sought by underemployed people. In September 2002, employed people performed 328.1 million hours of work during the Labour Force Survey reference week. If underemployed part-time workers had worked their preferred amounts of work, this total would have increased by 8.0 million hours (2.4%).

Job search activities

In September 2002, more than half (56%) of all underemployed part-time workers were actively looking for additional hours of work. The most frequent steps taken by these people to find additional work were contacting prospective employers (66%), looking in newspapers (57%) and asking their current employer for more work (53%). Almost one-quarter (24%) had registered with Centrelink for job search assistance.

UNDEREMPLOYED PART-TIME WORKERS(a),
All steps taken to find work in the last four weeks

(a) Underemployed part-time workers looking for additional hours of work.
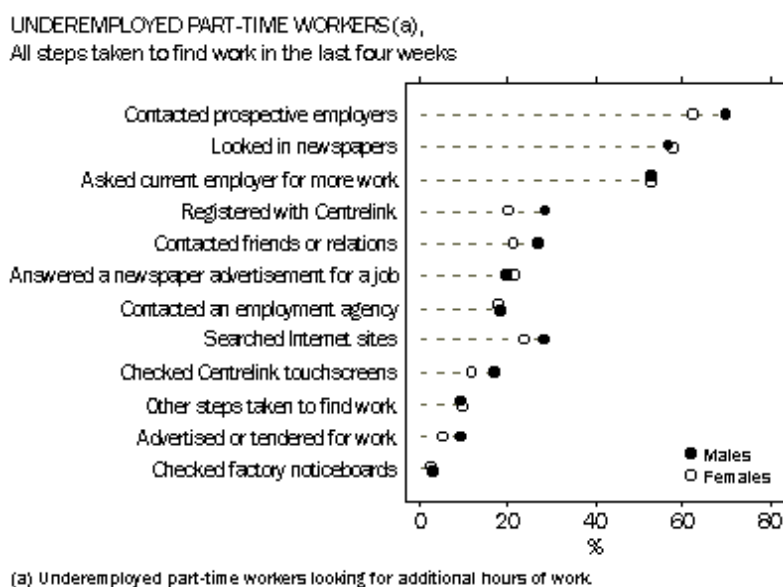
Difficulties in finding work

In September 2002, almost one in three (30%) underemployed part-time workers looking for additional hours of work said their main difficulty in finding work with more hours was that there were no vacancies in their line of work, or simply no vacancies at all. For an additional 29%, the main difficulty was that there were too many applicants for available jobs, that they were considered too young or too old by employers, or that they lacked necessary skills or education.

Men were more likely than women to mention one of these five reasons as their main difficulty in finding additional work (62% of male part-time workers looking and available for additional work compared with 56% of females). Women were more likely than men to cite difficulties related to a lack of necessary skills or education (9% of males compared with 12% of females) and unsuitable hours (6% of males compared with 10% of females).

UNDEREMPLOYED PART-TIME WORKERS(a),
Main difficulty in finding additional work

(a) Underemployed part-time workers looking for additional hours of work.
(b) Includes: own ill health or disability; too far to travel/transport problems; language difficulties; difficulties with ethnic background; difficulties with child care; other family responsibilities; and other difficulties.
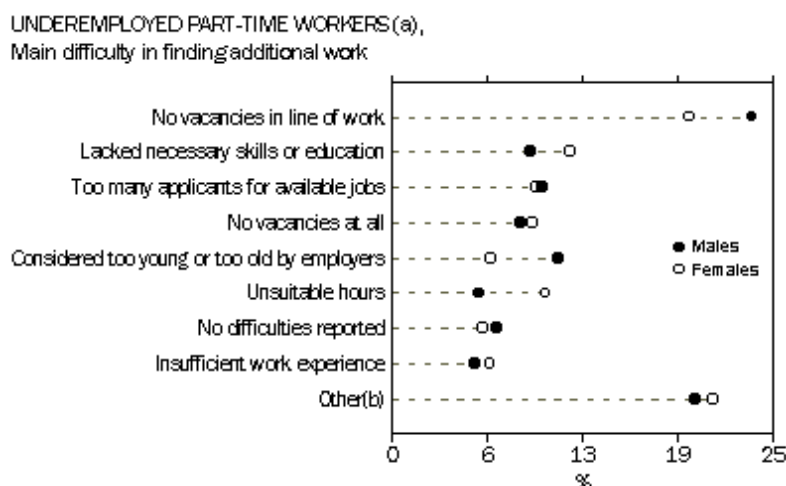
MEASURES OF LABOUR UNDERUTILISATION

The ABS recently introduced two new indicators of labour underutilisation based on the unemployed, the underemployed, and some of the people with marginal attachment to the labour force. These broader measures of underutilised labour help overcome some of the limitations inherent in the unemployment rate for measuring the degree to which labour resources are not fully utilised in the economy.

In September 2002, the labour force underutilisation rate, incorporating unemployed and underemployed people, was almost twice the size of the unemployment rate (12% compared with 6%). The extended labour force underutilisation rate, which includes unemployed people, underemployed people and some people marginally attached to the labour force, was 13%.

UNDERUTILISED LABOUR, Aged 15 years and over - September 2002

	Number '000	Rate %
Persons in the labour force		
Unemployed persons	628.5	6.2
Underemployed persons	574.3	5.7
Labour force underutilisation	**1,202.8**	**11.9**
Persons not in the labour force		
Underutilised labour not in the labour force	121.9	
Extended labour force underutilisation (b)	**1,324.6**	**13.0**

Footnotes
(a) Includes: persons actively looking for work, not available to start work in the reference week but available to start within four weeks; and discouraged jobseekers.
(b) The unemployed plus the underemployed plus group (a), as a percentage of the labour force plus group (a).

FURTHER INFORMATION

For further information on the characteristics of underemployed workers, please contact Jon Havelock on Canberra 02 6252 7747.

Information Paper: Measures of Labour Underutilisation (cat. no. 6296.0) describes concepts behind the ABS measures of labour underutilisation in detail. For further information relating to ABS measures of labour underutilisation, please contact Rhonda de Vos on Canberra 02 6252 7437 or email **<rhonda.devos@abs.gov.au>**.

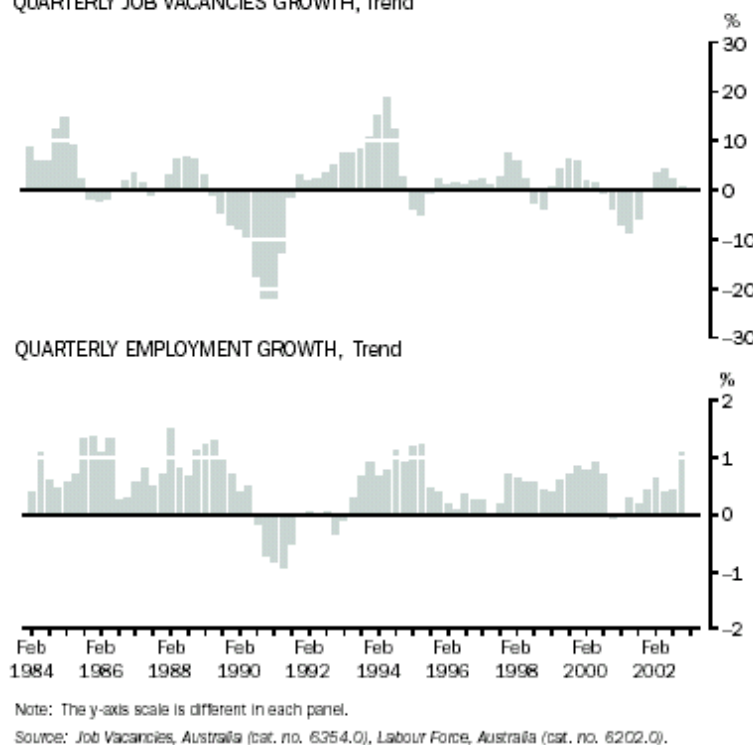# Do job vacancies provide a leading indicator of employment growth? (Feature Article)

Feature Article - Do job vacancies provide a leading indicator of employment growth?

INTRODUCTION

Each quarter the Australian Bureau of Statistics (ABS) publishes estimates of the total number of job vacancies in Australia. Estimates are also published for the private and public sectors, for each state and territory, and for the major industry groups. These estimates come from the quarterly ABS Job Vacancies Survey which is a nation-wide survey of employers. The ABS has been collecting data on job vacancies since 1973. A quarterly job vacancies series has been produced since 1979, with state/territory and industry dissections available since 1983.

Job vacancies statistics provide an important indicator of current and future demand for labour. As illustrated in figure 1, there is a relationship between change in the number of job vacancies and growth in employment. Although change in the number of job vacancies can provide an indication of short-term employment growth, job vacancies statistics can also be used as an indicator of longer-term employment growth. Changes in the number of job vacancies are used by a number of government and other research agencies for economic modelling, and for forecasting employment and economic growth.

FIGURE 1:
QUARTERLY JOB VACANCIES GROWTH, Trend

QUARTERLY EMPLOYMENT GROWTH, Trend

Note: The y-axis scale is different in each panel.

Source: Job Vacancies, Australia (cat. no. 6354.0), Labour Force, Australia (cat. no. 6202.0).

This article looks at the relationship between changes in job vacancies and employment growth. It first looks at this relationship in terms of how an increase in demand for goods and services may translate into decisions to hire additional workers, and to employment growth. The article then describes two statistical methods for analysing the strength of the relationship between job vacancies and employment growth, and presents the results of the analysis.

Based on data from 1984 to 2002, the analysis shows that the ABS job vacancies series has been a 'leading indicator', leading employment growth on average by around 3 quarters, although the lead period was longer for peaks than for troughs in employment growth, and there has been a decline in the lead period in more recent business cycles.

VACANCIES AND EMPLOYMENT GROWTH

In the short term, the demand for labour is affected by growth in output (i.e. the production of goods and services). For example, an increase in demand for a firm's product may lead initially to an increase in the number of hours worked by existing employees. If the increase in demand is sustained, the employer may want to increase the number of workers employed to sustain the increased level of output. A job vacancy is created between the period of increased output and the eventual employment of additional staff. A decrease in demand for a firm's product may also affect labour demand, initially as a decrease in hours worked and fewer vacancies and, if demand remains subdued, as a decrease in employment.

It may take some time from when recruitment action is undertaken to the time a position is filled, so that an increase in job vacancies in the current period may lead to an increase in employment in a subsequent period. If the time between lodging and filling a vacancy is reduced, the expected lead time between vacancies and employment growth may fall. Changes in the efficiency of the labour market in matching skills required by employers with the skills of job seekers may also have an impact on the relationship between vacancies and employment growth.

The vacant position may be filled by a person moving from one job to another (labour market

'churning'), delaying the increase in total employment even further. Because vacancies can be created as a result of existing employees leaving their jobs to move to another job, to become unemployed, or to leave the labour force altogether, the current number of job vacancies may overstate the number of **new** jobs. The combination of factors such as 'churning' in the labour market and changes in the efficiency of the labour market may have an impact on the statistical relationship between changes in job vacancies and employment growth over time, and will vary with the stage of the economic cycle, although their impact may be difficult to isolate.

STRENGTH OF THE RELATIONSHIP

The relationship between job vacancies and employment growth was analysed using two statistical techniques:

- correlation analysis

- turning point analysis.

The statistical analysis uses estimates of job vacancies and estimates of the number of people employed, over the period February 1984 to November 2002. The job vacancies series, which represents the number of employee jobs available for immediate filling and for which employers have undertaken recruitment action, is based on the quarterly ABS Job Vacancies Survey conducted in February, May, August and November each year. The estimates of employment are based on monthly Labour Force Survey (LFS) results for those same months. The LFS provides information about the labour market activity of Australia's population, such as the number of people employed, unemployed and not in the labour force. The employment series measures the number of employed people, some of whom may have more than one job, and includes self-employed persons as well as employees.

Correlation analysis is used to measure the degree of linear association between two variables. The higher the correlation coefficient (i.e. closer to +1 or -1), the stronger the association between the two variables. The sign of the coefficient indicates the nature of the relationship - a large positive coefficient indicates that high values of one variable tend to be associated with high values of the other variable. By examining the correlation between the job vacancies and employment series, the strength of the relationship between the two series can be assessed. The analysis can also examine whether vacancies are more strongly correlated with employment growth in future (or previous) quarters (lead-lag analysis).

A primary requirement when using correlation analysis is that all series should be 'stationary', with constant mean and variance. Employment, for example, increases continually (trends upwards) over the reference period and is considered a 'non-stationary' series. It is therefore important to remove the long-term trend component of the series to be analysed. If the trend component is not removed, the analysis may give misleading results, because the strength of the correlation would relate more to the common trend in the two series rather than quarterly movements. Removing the trend was achieved by applying the correlation analysis to quarter on quarter percentage change in the trend job vacancies and employment series.

FIGURE 2: CORRELATION COEFFICIENT,
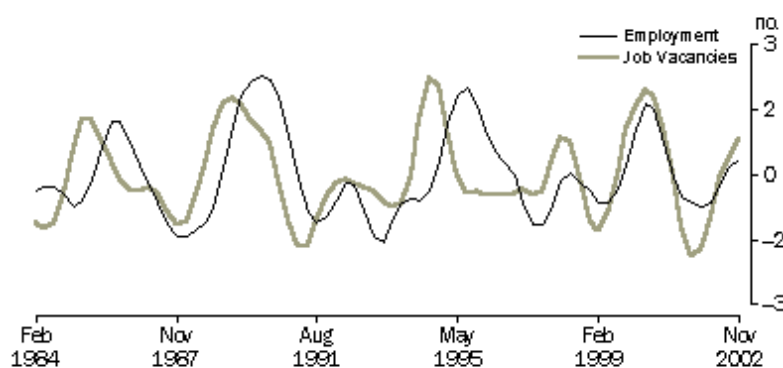Change in job vacancies with employment growth
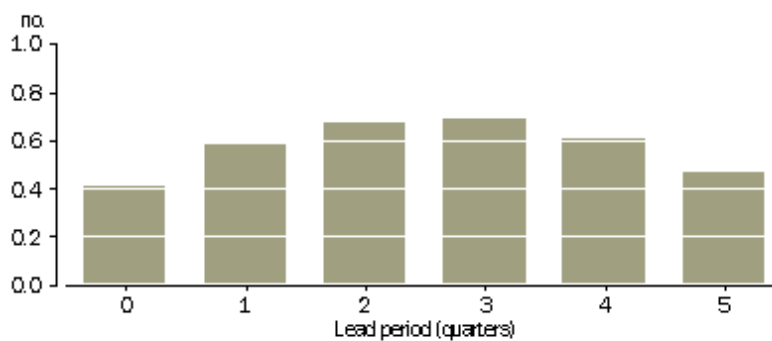
Source: Job Vacancies, Australia (cat. no. 6354.0), Labour Force, Australia (cat. no. 6202.0).

Results from the analysis show that there is a linear association between the quarterly changes in job vacancies and employment over the period 1984 to 2002, and that the quarterly changes tend to move in the same direction. The analysis also compared the strength of the relationship between changes in job vacancies in one quarter and employment growth in the following 1 to 5 quarters (figure 2). The strongest correlation coefficient (of 0.69) was found between the job vacancies series in one quarter and the employment series 3 quarters ahead, indicating that the growth in job vacancies leads employment growth by about 3 quarters.

Turning point analysis involves capturing the business cycle component from each series (by identifying the cyclical component from the other time series components such as seasonal, irregular and long-term trend components) and then comparing the respective lead-lag relationship over time. Broadly, this entails applying Henderson moving averages to remove short cycles of less than two years and very long cycles of more than eight years.

FIGURE 3: TURNING POINT ANALYSIS, Standard deviations from long-term trend

Source: Job Vacancies, Australia (cat. no. 6354.0), Labour Force, Australia (cat. no. 6202.0).

The turning point analysis can be used to analyse cycles, where a full cycle represents the movement from peak - trough - peak or from trough - peak - trough. Figure 3 illustrates the cyclical component of the two series (as standard deviations from the long-term trend, to provide a clearer visual representation of the turning points). It indicates that the employment and job vacancies series have four full cycles between February 1984 and November 2002.

The graph suggests that changes in the job vacancies series lead employment growth peaks by between 0 and 4 quarters over the period. The lead relationship appears to be shorter (0 to 2 quarters) for troughs. The lead period between peaks in job vacancies and employment series appears to have reduced recently, possibly reflecting changes in the overall performance of the labour market in matching job vacancies and jobseekers.

OTHER STATISTICS OF JOB VACANCIES

The ABS job vacancies statistics are the main source of estimates of the number of unfilled positions available at a point in time. However, the series are not the only source of information about job vacancies. The number of job advertisements can also reflect the number of vacant jobs. Although these may be easier to count than the number of unfilled positions, job advertisements have some drawbacks. For example, a vacancy can be advertised several times, or not at all, and a single job advertisement may refer to multiple vacancies.

The monthly ANZ Bank newspaper job advertisements series has been compiled from newspaper job advertisements placed in major metropolitan newspapers around Australia since 1975. The series is used by economic modellers and forecasters as an indicator of employment growth and of economic activity. The same two statistical techniques were applied to measure the strength of the relationship between the ANZ Bank job advertisements series and employment growth. The results were similar to those for the ABS job vacancies series. Over the period 1984 to 2002, the ANZ Bank series had its strongest correlation coefficient (of 0.75) at a lead period of 3 quarters. The turning point analysis shows job advertisements leading peaks in employment growth by 1 to 3 quarters. The lead relationship is shorter for troughs, ranging from 0 to 2 quarters. As with the ABS job vacancies series, the lead period between peaks in ANZ Bank job advertisements series and the employment series appears to have reduced recently.

The Department of Employment and Workplace Relations also compiles three series of job vacancies. The Skilled Vacancies Index, which has been available since 1981, is based on a count of advertisements for skilled workers (professional, associate professional and trades occupations) in the major metropolitan newspapers. This series is designed to measure skilled vacancies only, and leaves out a considerable proportion of job vacancies. Nevertheless, the series has followed a similar pattern to the ABS series and the ANZ Bank series. The Information and Communication Technology (ICT) Vacancy Index, which is available only since January 2000, measures demand for people with information and communication technology skills, using information from a number of online recruiting sites. The Vacancies on Australian JobSearch series refers to the number of positions available, based on information lodged by employers and Job Network members with the Department of Employment and Workplace Relations employment site Australian JobSearch.

FURTHER INFORMATION

This article also appears in the May 2003 issue of **Australian Economic Indicators** (cat. no. 1350.0).

More detailed analysis was also conducted using cross-spectral techniques which assess the lead-lag relationship at varying cycle lengths. These results were in line with the correlation and turning point analysis.

For further information about the methods used and the results of this analysis, please contact Daniel Smith on Canberra 02 6252 7649, or email **<daniel.smith@abs.gov.au>**. For information on the ABS Job Vacancies series, please contact Manpreet Singh on Perth 08 9360 5304, or email **<manpreet.singh@abs.gov.au>**.